IN THE CLAIMS

Claim 1 (original): A method of detecting a biological analyte within a sample, wherein said analyte can be electrically charged or polarized in the presence of an electric field, said method comprising:

placing said sample in proximity with a ferroelectric transducer;

establishing an electric field to polarize said analyte in said sample;

sensing an electric response of said ferroelectric transducer resulting from said electric field and indicative of the presence of said analyte in said sample.

Claim 2 (original): The method of claim 1, further comprising determining a signal difference between said electric response and a reference signal, said signal difference indicative of the presence of said analyte.

Claim 3 (original): The method of claim 2, wherein said signal difference is indicative of the concentration or density of said analyte.

Claim 4 (currently amended): The method of ~~any one of claims 1 to 3~~ claim 1, comprising disposing said transducer and said sample between first and second electrodes, and applying a voltage to said first and second electrodes to establish said electric field in said sample.

Claim 5 (original): The method of claim 4 wherein said first electrode is in contact with said transducer and a second electrode is in contact with said sample.

Claim 6 (currently amended): The method of claim 4 ~~or claim 5~~ wherein said electric response is said voltage when a pre-selected electric current is flowing between said electrodes.

Claim 7 (currently amended): The method of claim 4 ~~or claim 5~~ wherein said electric response is the electric current flowing through said electrodes when said voltage has a pre-selected value.

Claim 8 (currently amended): The method of ~~any one of claims 1 to 7~~ claim 1, wherein said ferroelectric transducer comprises one or more of $Ba_xSr_{1-x}TiO_3$ (BST), $Pb(Zr_xTi_{1-x})O_3$ (PZT) and ferroelectric polymers, wherein x is between 0 and 1.

Claim 9 (currently amended): The method of ~~any one of claims 1 to 8~~ claim 1 wherein said transducer is a thin film.

Claim 10 (currently amended): The method of ~~any one of claims 1 to 9~~ claim 1 wherein said analyte is one of protein, DNA, virus, antigen-antibody, bacteria, fungus, and drug.

Claim 11 (currently amended): The method of ~~any one of claims 1 to 10~~ claim 1, wherein said placing comprises immobilizing said analyte in said sample on said transducer.

Claim 12 (original): The method of claim 11, wherein said analyte is immobilized directly on a ferroelectric layer of said transducer.

Claim 13 (original): The method of claim 11, wherein said immobilizing comprises binding said analyte to a probe molecule attached to said transducer, said probe molecule having specific affinity to said analyte.

Claim 14 (original): The method of claim 12, further comprising, after immobilizing said analyte on said transducer and before said sensing, removing a remaining portion of said sample and attaching a probe molecule to said analyte, said probe molecule having

specific affinity to said analyte, and wherein said electric response is indicative of the presence of said probe molecule and thus said analyte.

Claim 15 (original): A sensor for detecting a biological analyte within a sample, wherein said analyte can be electrically charged or polarized in an electric field, said sensor comprising:

a ferroelectric transducer;

a biological sample disposed adjacent said transducer;

first and second electrodes for establishing a potential difference across said sample to generate an electric field in said sample; and

an electric signal detector for sensing an electric response of said ferroelectric transducer resulting from polarization of said analyte, and indicative of the presence of said analyte in said sample.

Claim 16 (original): The sensor of claim 15 further comprising a source connected to one or more of said first and second electrodes for applying a voltage to said first and second electrodes.

Claim 17 (currently amended): The sensor of claim 15 ~~or claim 16~~, wherein said ferroelectric transducer comprises one or more of $Ba_xSr_{1-x}TiO_3$ (BST), $Pb(Zr_xTi_{1-x})O_3$ (PZT) and ferroelectric polymers, wherein x is between 0 and 1.

Claim 18 (currently amended): The sensor of ~~any one of claims 15 to 17~~ claim 15 wherein said transducer is a thin film.

Claim 19 (currently amended): The sensor of ~~any one of claims 15 to 18~~ claim 15 wherein said analyte is one of protein, DNA, virus, antigen-antibody, bacteria, fungus, and drug.

Claim 20 (currently amended): The sensor of ~~any one of claims 15 to 19~~ claim 15, wherein said first electrode is in contact with

said transducer and said second electrode is in contact with said sample.

Claim 21 (currently amended): The sensor of ~~any one of claims 15 to 20~~ claim 15 wherein said transducer is in contact with said sample.

Claim 22 (currently amended): The sensor of ~~any one of claims 15 to 21~~ claim 15 wherein said analyte in said sample is immobilized on said transducer.

Claim 23 (original): The sensor of claim 22, wherein said analyte is directly attached to said transducer.

Claim 24 (original): The sensor of claim 22, further comprising a probe molecule attached to said transducer, said probe molecule having specific affinity to said analyte, said analyte being bond to said probe molecule.